No. 200100258

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Washington State University Research Foundation

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, CLUB

'Bruehl'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of Washington, D.C. this thirteenth day of November, in the year two thousand two.*

Attest:

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions*

Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
WASHINGTON STATE UNIVERSITY RESEARCH FOUNDATION

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
WA007833

3. VARIETY NAME
Bruehl

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
1610 NE Eastgate Blvd.
Pullman, WA 99163
U.S.A.

5. TELEPHONE *(include area code)*
509.335.5526

6. FAX *(include area code)*
509.335.7237

FOR OFFICIAL USE ONLY

PVPO NUMBER
200100258

FILING DATE
August 10, 2001

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Corporation

8. IF INCORPORATED, GIVE STATE OF INCORPORATION
Washington

9. DATE OF INCORPORATION
July 7, 1939

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
Leona C. Fitzmaurice, Ph.D.
Washington State University Research Foundation
1610 NE Eastgate Blvd.
Pullman, WA 99163

FEES RECEIVED

FILING AND EXAMINATION FEES:
$ 2705.00
DATE 8/10/01

CERTIFICATION FEE:
$ 320.00
DATE 4/23/02

11. TELEPHONE *(Include area code)*
509.335.4363

12. FAX *(Include area code)*
509.335.7237

13. E-MAIL
fitzmaur@wsu.edu

14. CROP KIND *(Common Name)*
Winter wheat

15. GENUS AND SPECIES NAME OF CROP
Triticum aestivum L.

16. FAMILY NAME *(Botanical)*
Gramineae

17. IS THE VARIETY A FIRST GENERATION HYBRID?
☐ YES ☒ NO

18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)

a. ☒ Exhibit A. Origin and Breeding History of the Variety
b. ☒ Exhibit B. Statement of Distinctness
c. ☒ Exhibit C. Objective Description of Variety
d. ☐ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☒ Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)
g. ☒ Filing and Examination Fee ($2,705), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *See Section 83(a) of the Plant Variety Protection Act)*
☐ YES *(If "yes", answer items 20 and 21 below)* ☒ NO *(If "no", go to item 22)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? ☐ YES ☐ NO
IF YES, WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? ☐ YES ☐ NO
IF YES, SPECIFY THE NUMBER 1,2,3, *etc.* ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
☒ YES ☐ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☐ YES ☒ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
Leona Fitzmaurice			
NAME *(Please print or type)*		NAME *(Please print or type)*	
Leona Fitzmaurice			
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
Executive Director	Aug 9, 2001		

INSTRUCTIONS

200100258

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable *(in the sense that it will reproduce an entire plant)* tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for $2,705 ($320 filing fee and $2,385 examination fee), payable to "Treasurer of the United States" *(See Section 97.6 of the Regulations and Rules of Practice.)* Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of $320 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office
Telephone: (301) 504-5518
FAX: (301) 504-5291
Homepage: http://www.ams.usda.gov/science/pvpo/pvp.htm

ITEM

18a. Give:
(1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified

18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:

(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.

18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, *etc.*

18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.

19. If "Yes" is specified *(seed of this variety be sold by variety name only, as a class of certified seed)*, the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. *(See Regulations and Rules of Practice, Section 97.103).*

22. *See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.*

23. *See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.*

21. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

NOT APPLICABLE

22. CONTINUED FROM FRONT *(Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)*

Foundation seed was sold on January 26, 2001 by the Washington State Crop Improvement Association for registered seed increase in the crop year 2001.

23. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

NOT APPLICABLE

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. *(See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)*

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center--East, Beltsville, MD 20705. Telephone: (301) 504-8089. http://www.ams.usda.gov/lsg/seed/ls-sd.htm

S&T-470 (04-01) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (02-99) which is obsolete.

2

EXHIBIT A – ORIGIN AND BREEDING HISTORY
'BRUEHL'

Pedigree: UNA(NS1971)/5/Oasis/4/Luke//Itana/CItr1343(WA6362)/3/ Luke Mutant 14(WA6242)/6/Tres/Eltan

1989: Final cross made: WSU research land.

1990: F_1 generation; WSU research land; all plants uniform.

1991: F_2 bulk population; WSU research land; selected 100 random spikes; segregating for maturity, plant height, head type and disease resistance.

1992: F_3 bulk population; WSU research land; no selection applied; segregating for maturity, plant height, head type and disease resistance.

1993: F_4 bulk population; WSU research land; selected 150 random spikes; segregating for maturity, plant height, head type and disease resistance.

1994: F_5 head row (F4 –derived); WSU research land; selection based on appropriate plant height, maturity, and disease resistance.

1995: F_6 Single Plot Nursery (tested as VO95435); WSU research land and Waterville, WA Snowmold Observation Nursery; selection based on based on appropriate plant height, maturity, straw strength, field resistance to snowmold, leaf and stripe rust.

1996: F_7 State Advanced Yield Trial; WSU research land; selection based on appropriate plant height, maturity, straw strength, field resistance to snowmold, leaf and stripe rust, test weight, grain yield, and milling and baking quality.

1997: F_8 (tested as WA007833) State Advanced Yield Trial; WSU research land; selection based on appropriate plant height, maturity, straw strength, field resistance to snowmold, leaf and stripe rust, test weight, grain yield, and milling and baking quality;.

1998: F_9 State Advanced Yield Trial; WSU research land; selection based on appropriate plant height, maturity, straw strength, field resistance to snowmold, leaf and stripe rust, test weight, grain yield, and milling and baking quality.

1999: WA007833 released as the cultivar 'Bruehl'

Evidence of uniformity and stability;

Except as noted below, Bruehl has been observed to be stable and uniform with respect to plant morphology since 1995 as an F5-derived line. This represents five generations (1995-1999) through which this stability and uniformity have been observed.

Bruehl may contain up to a total of 1 in 10,000 (combined) of the following naturally occurring variants:

- Awnless common head (usually tall plants)
- Awned common head
- Awnless club head
- Awned, very compact club head (compared to typical Bruehl head)
- Light green (rather than blue-green) club wheat plant before maturity
- Semi-compact heads which appear to be intermediate between club and common head types

In addition to the above variants the following observations may be made:

- Height variation (8" to 10 " taller) may occur at the rate of 1 in 10,000 for heads that are otherwise typical for of these varieties. Height variation will be noticeable under higher yielding environments.
- Bruehl awns are typically long but may be absent or present on the lower spikelets. Bruehl awns have a tendency to break at maturity, especially if heads rub due to wind, irrigation or other mechanical forces. These differences in awn characteristic should be considered normal for the variety.

- *Exhibit A – Clarify how UNA(NS1971) relates to the subject variety:*

UNA(NS1971) refers to a winter wheat cultivar received from Yugoslavia in 1971 named Novi Sad.

EXHIBIT B. –STATEMENT OF DISTINCTNESS

Bruehl is most similar to Hiller and Coda for club wheat production in eastern Washington State.

A. Genetic Characteristics (Fig. 1)

The club wheat cultivar Bruehl shows difference from the other two club cultivars Hiller and Coda at microsatellite locus *Xgwm558* located around the centromere region of chromosome 2A (Roder er al., 1998). Different alleles were detected in these three cultivars. A close up of the critical band is shown in Fig. 1.

Röder, M.S., V. Korzun, B. Gill,and M.W. Ganal. 1998. The physical mapping of microsatellite markers in wheat. Genome, 41:278-283.

B. Plant Characteristics (Fig. 2)

Bruehl's plant characteristics are distinct from Coda and Hiller as shown in Fig.2.

The following table shows Bruehl's plant characteristics are distinct from Coda and Hiller:

Characteristic	Bruehl	Coda	Hiller
Spike shape	elliptical	elliptical to dense	elliptical to clavate
Density	middense	dense	dense
Awnedness	awned	awned	awnless to awnletted
Awn characters	spreading	appressed	does not apply (awnless)
Hardiness (LT_{50})	-12.61°C	-10.74°C	-12.2°C

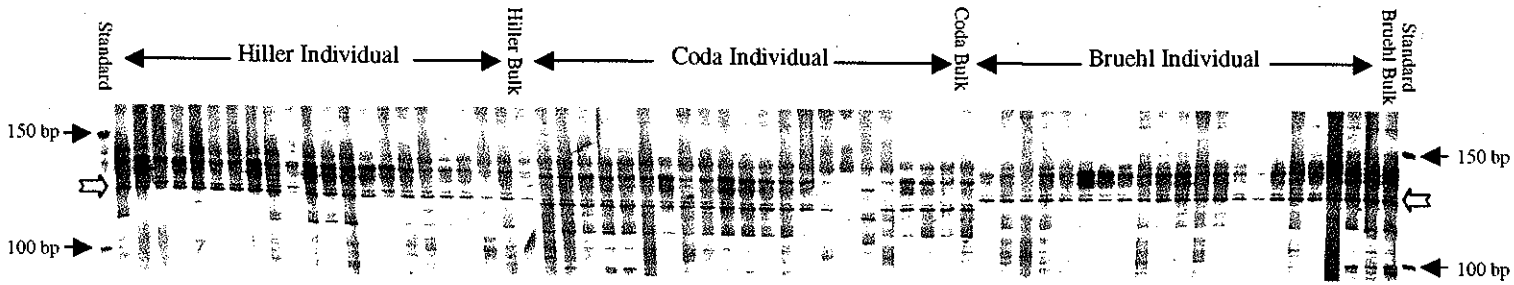

Fig. 1 Variability of PCR-amplified microsatellite locus *Xgwm558* located on chromosome 2A in club wheat cultivars 'Bruehl', 'Coda', and 'Hiller'. Block arrows point to polymorphic bands.

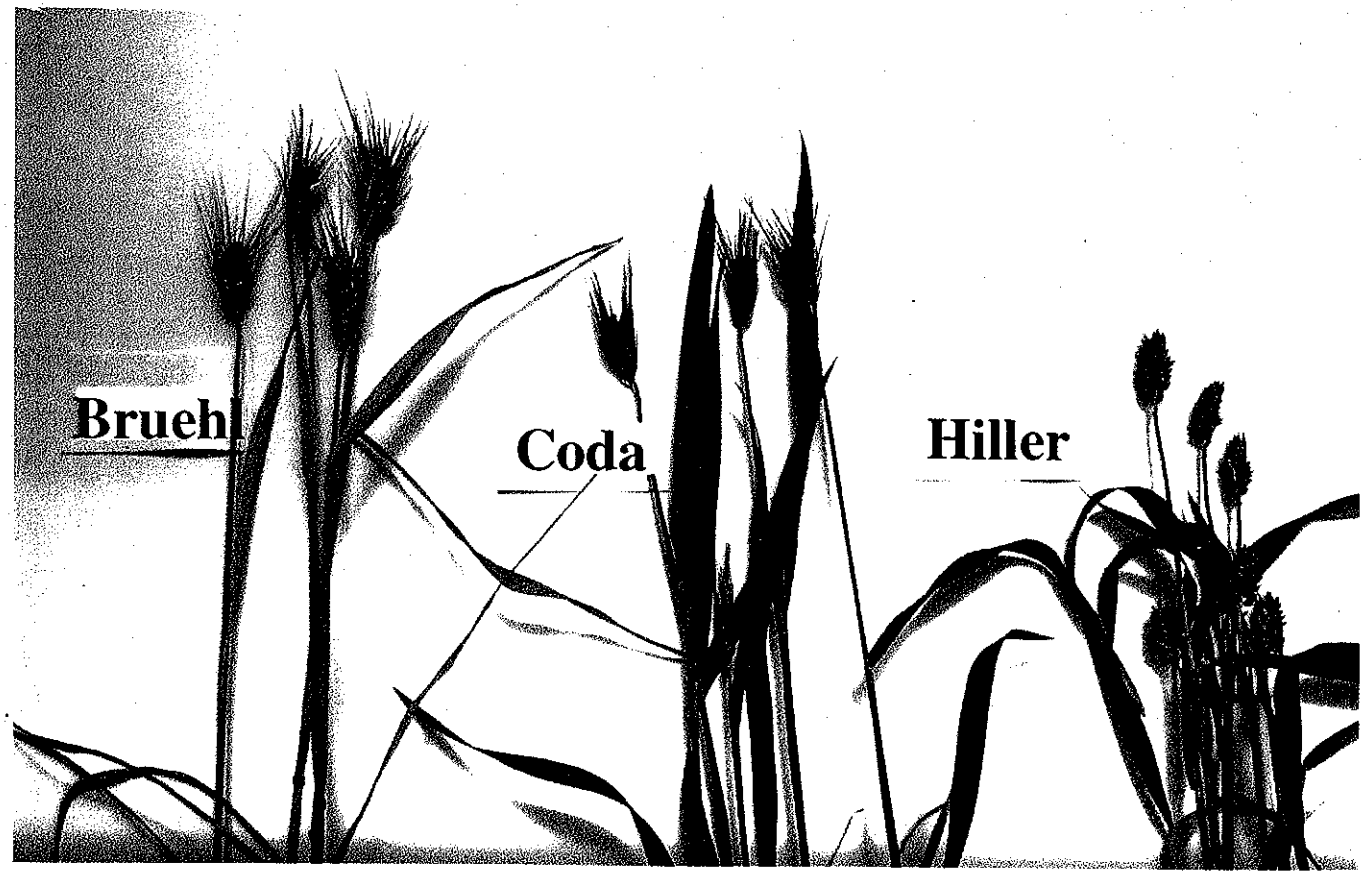

Fig. 2. Plant Characteristics of Bruehl, Coda, and Hiller

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S)

Washington State University Research Foundation

ADDRESS *(Street and No. or RD No., City, State, and Zip Code)*

1610 NE Eastgate Blvd.
Pullman, WA 99163
U.S.A.

FOR OFFICIAL USE ONLY

PVPO NUMBER

200100258

VARIETY NAME

Bruehl

TEMPORARY OR EXPERIMENTAL DESIGNATION

WA007833

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. [0][9][9] or [0][9]) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used:
Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

[3] 1=Common 2=Durum 3=Club 4=Other (SPECIFY) : _____

2. VERNALIZATION:

[2] 1=Spring 2=Winter 3=Other (SPECIFY) : _____

3. COLEOPTILE ANTHOCYANIN:

[1] 1=Absent 2=Present

4. JUVENILE PLANT GROWTH:

[3] 1=Prostrate 2=Semi-erect 3=Erect

5. PLANT COLOR (boot stage):

[2] 1 = Yellow-Green 2 = Green 3 = Blue-Green

6. FLAG LEAF (boot stage):

[1] 1 = Erect 2 = Recurved [1] 1 = Not Twisted 2 = Twisted

7. EAR EMERGENCE:

[0][2] Number of Days Earlier Than Eltan *

[0][3] Number of Days Later Than Hiller *

8. ANTHER COLOR:

[1] 1 = Yellow 2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

[0 0] cm Taller Than Hiller *

[0 6] cm Shorter Than Coda *

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

10. STEM:

A. ANTHOCYANIN

[1] 1= Absent 2=Present

B. WAXY BLOOM

[1] 1=Absent 2=Present

C. HAIRINESS (last internode of rachis)

[1] 1=Absent 2=Present

D. INTERNODE (SPECIFY NUMBER)

[1] 1= Hollow 2=Semi-solid 3=Solid

E. PEDUNCLE

[2] 1=Absent 2=Present

[ ] cm Length

11. HEAD (at Maturity):

A. DENSITY

2 ~~[3]~~ 1=Lax 2=Middense 3= Dense

MH 2-15-2002

B. SHAPE

[4] 1 = Tapering 2= Strap 3 = Clavate 4 = Other (SPECIFY): elliptical

C. CURVATURE

[1] 1 = Erect 2 = Inclined 3 = Recurved

D. AWNEDNESS

[4] 1 = Awnless 2 = Apically Awnletted 3 = Awnletted 4 = Awned

12. GLUMES (at Maturity):

A. COLOR

[1] 1 = White 2 = Tan 3 = Other (SPECIFY) : _____

B. SHOULDER

2-3 ~~[2]~~ 1 = Wanting 2 = Oblique 3 = Rounded 4 = Square 5 = Elevated 6 = Apiculate

MH 2-15-2002

C. BEAK

[1] 1 = Obtuse 2 = Acute 3 =Acuminate

D. LENGTH

[1] 1 = Short (ca. 7mm) 2 = Medium (ca. 8mm) 3 = Long (ca. 9mm)

200100258

12. GLUMES (at Maturity) *Continued*:

E. WIDTH

[2] 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm) 3 = Wide (ca. 4mm)

13. SEED:

A. SHAPE

[1] 1 = Ovate 2 = Oval 3 = Elliptical

B. CHEEK

[1] 1=Rounded 2=Angular

C. BRUSH

[2] 1=Short 2=Medium 3=Long

[1] 1 = Not Collared 2 = Collared

D. CREASE

[2] 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

[2] 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

E. Color

[1] 1=White 2= Amber 3= Red
4= OTHER (Specify)

G. PHENOL REACTION *(see instructions)*:

[4] 1 = Ivory 2 = Fawn
3 = Light Brown 4 = Dark Brown
5 = Black

F. TEXTURE

[2] 1=Hard 2=Soft

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

[0] Stem Rust *(Puccinia graminis* f. sp. *tritici)*

[2] Stripe Rust *(Puccinia striiformis)*

[0] Tan Spot *(Pyrenophora tritici-repentis)*

[0] Halo Spot *(Selenophoma donacis)*

[0] *Septoria nodorum* (Glume Blotch)

[0] *Septoria avenae* (Speckled Leaf Disease)

[0] *Septoria tritici* (Speckled Leaf Blotch)

[0] Scab (*Fusarium* spp.)

[3] Leaf Rust *(Puccinia recondita* f. sp. *tritici)*
Puccinia triticia

[0] Loose Smut *(Ustilago tritici)*

[0] Flag Smut *(Urocystis agropyri)*

[0] Common Bunt *(Tilletia tritici* or *T. laevis)*

[2] Dwarf Bunt *(Tilletia controversa)*

[0] Karnal Bunt *(Tilletia indica)*

[0] Powdery Mildew *(Erysiphe graminis* f. sp. *tritici)*

[2] "Snow Molds"
Typhula idahoensis

14. Disease *(Continued)* (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

[0]	"Black Point" (Kernel Smudge)	[0]	Common Root Rot *(Fusarium, Cochliobolus* and *Bipolaris* spp.*)*
[0]	Barley Yellow Dwarf Virus (BYDV)	[0]	Rhizoctonia Root Rot *(Rhizoctonia solani)*
[0]	Soilborne Mosaic Virus (SBMV)	[0]	Black Chaff *(Xanthomonas campestris* pv. *translucens)*
[0]	Wheat Yellow (Spindle Streak) Mosaic Virus	[0]	Bacterial Leaf Blight *(Pseudomonas syringae* pv. *syringae)*
[0]	Wheat Streak Mosaic Virus (WSMV)	[3]	Other (SPECIFY) Pseudocercosporella herpotrichoides
[3]	Other (SPECIFY) Cephalosporium gramineum	[ ]	Other (SPECIFY)
[ ]	Other (SPECIFY)	[ ]	Other (SPECIFY)
[ ]	Other (SPECIFY)	[ ]	Other (SPECIFY)

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

[0]	Hessian Fly *(Mayetiola destructor)*	[ ]	Other (SPECIFY)
[0]	Stem Sawfly *(Cephus* spp.)	[ ]	Other (SPECIFY)
[0]	Cereal Leaf Beetle *(Oulema melanopa)*	[ ]	Other (SPECIFY)
[0]	Russian Aphid *(Diuraphis noxia*	[ ]	Other (SPECIFY)
[0]	Greenbug *(Schizaphis graminum)*	[ ]	Other (SPECIFY)
[0]	Aphids	[ ]	Other (SPECIFY)

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

F_3 generation by the single-pod bulk method. The single-pod bulk method consists of picking one three-seeded pod from each plant in a segregating population. The seed from all pods which were picked is threshed as a bulk and put into one envelope. A random sample of one-third of the seed in the envelop is planted to form the segregating population of the next generation. The F_3 population was grown in the 1994–1995 winter nursery located at Los Andes and F_3 plants from the segregating population were individually threshed. $F_{3:4}$ plant rows were selected in 1995. ND95-931 was first tested in replicated yield trials in 1996.

Barnes was evaluated in the Uniform Regional Test 0, Northern States, in 1998 and 1999 (Wilcox, 1999). In the 2 yr of testing in the Uniform Soybean Test 0, Barnes averaged 9% higher in seed yield than 'Traill' and 5% less than 'Lambert' (Helms and Nelson, 1998; Orf and Kennedy, 1994). Traill is a 0.0 Maturity Group cultivar and Lambert is a 0.8 Maturity Group cultivar. Barnes matures 3 d later than Traill and 5 d earlier than Lambert and is a 0.3 Maturity Group cultivar. Lodging and seed quality scores of Barnes are similar to Traill. Plant height of Barnes is 15 cm taller than Traill and the same as Lambert. Seeds of Barnes are 19 mg seed^{-1} larger than Traill and 10 mg seed^{-1} larger than Lambert. Protein content of Barnes was 407 g kg^{-1} and oil content was 215 g kg^{-1}, compared with 409 g kg^{-1} protein content and 211 g kg^{-1} oil content for Traill.

Barnes has purple flowers, grey pubescence, brown pod color, dull yellow seed coat, and buff hila. Barnes has indeterminate growth habit and is adapted as a full-season cultivar from 45 to 47°N lat. Barnes was evaluated in the Red River Valley of the North from 1996 to 1999 by the North Dakota State University and University of Minnesota soybean breeding projects for a total of 21 location-years. In these Red River Valley tests, Barnes averaged 9% higher seed yield than Traill and matured 5 d later. Barnes yielded the same as Lambert and matured 5 d earlier. Barnes was resistant to races 3, 4, and 25, but susceptible to races 7 and 17 of phytophthora root rot (caused by *Phytophthora sojae* M.J. Kaufmann & J.W. Gerdemann).

Breeder seed of Barnes will be maintained by NDSU. A small sample of seed for research purposes can be obtained from the corresponding author for at least 5 yr. U.S. Plant Variety Protection for Barnes has been applied for.

T.C. Helms,* B.D. Nelson, and R.J. Goos

References

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★ Registration of 'Bruehl' Wheat

'Bruehl' (Reg. no. CV-912, PI 606764) is a club soft white winter (SWW) wheat (*Triticum aestivum* L.) developed by the Agricultural Research Center of Washington State University (WSU) in cooperation with the Agricultural Experiment Station of the University of Idaho and the United States Department of Agriculture-Agricultural Research Service (USDA-ARS). Bruehl was named in honor of George (Bill) W. Bruehl, retired plant pathologist from WSU, Pullman, WA, and released for areas of the Pacific Northwest (PNW) that have severe speckled snow mold (caused by *Typhula idahoensis* Rems and *T. ishikariensis* Imai) disease problems.

Bruehl (WA007833, VO95435) was derived from the 1988 cross UNA(NS1971)/5/'Oasis'/4/'Luke'//'Itana'/CItr1343(WA 6362)/3/Luke Mutant 14(WA6242)/6/'Tres'/'Eltan'. Luke (Peterson et al., 1974) and Eltan (Peterson et al., 1991) are SWW common, Itana (Hehn and Klages, 1966) is a hard red winter, Oasis (Patterson et al., 1975) is a soft red winter and Tres (Allan et al., 1986) is a SWW club. The F_1 through F_5 generations were grown in Pullman and advanced by a modified pedigree-bulk breeding method, in which initial selections were based on general adaptive characteristics. It was selected as an F_6 head row from a snow mold observation nursery at Waterville, WA.

Bruehl is a semidwarf that matures 2 to 3 d earlier than Eltan, but under snow mold pressure will mature up to 7 d earlier. Spikes of Bruehl are awned, elliptical, middense and erect. Glumes are glabrous, white, midlong, midwide; shoulders oblique to rounded; and beaks midwide, acuminate, 0.5 to 1.5 mm in length. Kernels of Bruehl have club characteristics: white, soft, midlong, ovate; germ small; crease midwide, middeep; cheeks rounded; and brush midsized and midlong.

Based on natural field infections from 1995 to 1999 of races that are common (CDL-17, CDL-20, CDL-37, CDL-43, CDL-44, and CDL-45) to Washingston, Bruehl expresses adult plant resistance to stripe rust (caused by *Puccinia striiformis* Westend.). It is moderately susceptible to leaf rust (race MBCL: virulent on *Lr1*, *Lr3*, *Lr108*, and *Lr26*) (caused by *Puccinia triticina* Eriks; syn *Puccinia recondita* Roberge ex Desmaz. f. sp. *tritici* Eriks. and E. Henn.) and moderately susceptible to natural field infections of stem rust (caused by *P. graminis* Pers.:Pers.). It is moderately susceptible to eyespot (caused by *Pseudocercosporella herpotrichoides* (Fron.) Deighton) and Cephalosporium stripe (caused by *Cephalosporium gramineum* Nis.& Ika.). Bruehl has a high level of resistance to speckled snow mold. Its average snow mold rating (scale ranges from 0-8, with 0 equaling no recovery and 8 equaling complete recovery) from 1995 to 1997 (years with severe natural field infection of snow mold at Waterville, WA) was 5.2. 'Sprague' (Bruehl et al., 1978) (highly resistant) had an average snow mold rating of 5.8 and Eltan (moderately resistant) was 3.6 (Murray et al., 1999). Bruehl also exhibited resistance to dwarf bunt (caused by *Tilletia controversa* Kühn) in inoculated field tests.

In 58 replicated field trials over 4 years in Washington State, Bruehl produced on average 3.1 and 4.3% more grain per hectare than Eltan (5200 kg ha^{-1}) and 'Hiller' (Peterson et al., 1999) (5140 kg ha^{-1}), respectively. Grain volume weight was similar to Eltan (745 g L^{-1}) and 2.1% greater than Hiller (729 g L^{-1}). The average plant height of Bruehl is similar to

12

Eltan and Hiller (89 cm), but the straw strength (moderately stiff) is superior to Eltan (moderately weak). It is comparable to Eltan for emergence, but inferior to the tall club wheat cultivar 'Edwin' (Jones et al., 2000). Bruehl is similar to Hiller for cold hardiness and shattering.

On the basis of tests ($n = 26$) conducted by the USDA-ARS Western Wheat Quality Laboratory using grain produced in Washington from 1996 to 1998, Bruehl has excellent overall club SWW quality traits. Bruehl is similar to Hiller ($n = 5$ comparisons) for grain protein (9.6%), flour protein (8.2%), cookie diameter (9.6 cm), break flour yield (53.8%), sponge cake score (73), sponge cake volume (1280 cm^3), mixograph water absorption (52.8%), and top grain score (7.2).

U.S. plant variety protection for Bruehl will be applied for. Seed of Bruehl will be maintained by the Washington State Crop Improvement Association under supervision of the Department of Crop and Soil Sciences and the Washington State Agricultural Research Center, and may be obtained by contacting the corresponding author or through the National Plant Germplasm System (http://www.ars-grin.gov/npgs/[homepage]).

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Registration of 'Lebsock' Durum Wheat

'Lebsock' (Reg. no. CV-911, PI 613620), spring durum wheat (*Triticum turgidum* L. var. *durum* Desf.), was developed by the North Dakota Agricultural Experiment Station in cooperation with USDA-ARS and officially released on 1 July 1999. Lebsock was named in honor of Dr. Kenneth L. Lebsock, a USDA-ARS durum wheat breeder stationed at Fargo, ND, where he worked in close collaboration with researchers at North Dakota Agricultural Experiment Station developing durum wheat cultivars. Lebsock was released because of its high yield and test weight and good quality.

Lebsock was tested as D901442 and was selected from the cross 'Munich'/D8469 made in 1986 by R.G. Cantrell. The parent D8469 was derived from the cross D79220/D79122. The pedigree of D79122 is 'Edmore'/'Wakooma'. D79220 was derived from the cross 'Vic'/D7025. D7025 was derived from the cross D6468//D61130/'Leeds'. Lebsock was developed using the pedigree method and was bulked in the F_5 generation as an F_4-derived line in 1990. Lebsock was tested for agronomic and quality traits at 51 location-years from 1994 to 1998.

Lebsock is a daylength-sensitive durum wheat that is similar in heading date to 'Ben' (Elias and Miller, 1998) (58 d) and 1.3 d earlier than 'Mountrail' (Elias and Miller, 2000b). Lebsock's plant height averages 85 cm and is 4 cm shorter than Ben and 14 cm taller than the semidwarf cultivar 'Lloyd' (Cantrell et al., 1984). The culms are white and the peduncle is slightly recurved. Lebsock's spikes are midlong, awned, oblong, middense, and erect. The awns are white and 12 to 13 cm in length. The glumes are glabrous, white, long, and wide. The kernels are amber, hard, long, and elliptical; the germ is midsized; the crease is midwide and shallow; and the brush is absent.

Mean grain yield of Lebsock (3696 kg ha^{-1}) was 4.0 and 4.6% higher than Ben and 'Renville' (Cantrell et al., 1989), respectively, on the basis of 51 location-years of testing in the Uniform Regional Durum Nursery from 1994 to 1998. Lebsock (3286 kg ha^{-1}) had a 8.2 and 7.7% higher mean yield than both Ben and Renville, respectively on the basis of 23 location-years in the North Dakota Research Extension Centers' varietal trials from 1994 to 1998. Lebsock had 781.8 kg m^{-3} grain volume weight and 37.7 mg kernel weight when tested at 51 location-years in the Uniform Regional Durum Nursery. Lebsock has 10.3 kg m^{-3} higher grain volume weight and 2.0 mg lower kernel weight than Ben.

On the basis of 30 location-years in North Dakota field plots (1994 to 1998), the semolina extraction rate of Lebsock (61.2%) on the Buhler-Miag laboratory mill at the Department of Cereal Science, North Dakota State University, is higher than Ben (60.8%). Other milling characteristics and spaghetti color were favorable. Lebsock has strong gluten mixing characteristics (classification: 6.0) as estimated by mixograph, weaker than 'Maier' (Elias and Miller, 2000a) and similar to Ben (classification: 7.0 and 6.0, respectively). Semolina protein of Lebsock was 136 g kg^{-1}, which is similar to Ben and Renville but lower than Maier (144 g kg^{-1}).

Lebsock was evaluated at the USDA-ARS, Northern Crop Science Laboratory, Fargo, ND for wheat stem rust (caused by *Puccinia graminis* Pers.:Pers. f. sp. *tritici* Eriks. & E. Henn) and was found to be highly resistant to pathotypes Pgt-QCCJ, -QTHJ, -RTQQ, -TMLK, -TPMK, and -HPHJ. Lebsock's adult plant resistance in the field to leaf rust (caused by *P. triticina* Eriks.) is high (5R) and is similar to Ben and Renville. Lebsock has a moderate level of resistance to tan spot [caused by *Pyrenophora tritici-repentis* (Died.) Drechs]. Lebsock is moderately susceptible to Fusarium head blight [caused by *Fusarium graminearum* Schwabe; teleomorph *Gibberella zeae* (Schweinitz) Petch].

Breeder seed will be maintained by the Seedstocks Project, Agricultural Experiment Station, North Dakota State Univ., Fargo, ND 58105-5051. Protection for Lebsock will be applied for under the U.S. Plant Variety Protection Act for Foundation, Registered, and Certified seed.

E.M. Elias,* J.D. Miller, and F.A. Manthey

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Table 1. NURSERY SOURCES FOR WA7833 DATA SET

YEAR	NURSERY	NURSERY NAME	LOCATION	BREEDER
96	24	CLUB 1	CONNELL	S.S. JONES
96	25	CLUB 1	COULEE CITY	S.S. JONES
96	26	CLUB 1	HARTLINE	S.S. JONES
96	27	CLUB 1	POMEROY	S.S. JONES
96	28	CLUB 1	PULLMAN	S.S. JONES
96	29	CLUB 1	WATERVILLE	S.S. JONES
97	1000*	CLUB 1/WA7833 SWW VARIETY RELEASE	COULEE CITY	S.S. JONES
97	1168**	WA7833 SWW VARIETY RELEASE	CONNELL	S.S. JONES
97	2000*	CLUB 1/WA7833 SWW VARIETY RELEASE	HARTLINE	S.S. JONES
97	3000*	CLUB 1/WA7833 SWW VARIETY RELEASE	LIND	S.S. JONES
97	3168**	WA7833 SWW VARIETY RELEASE	HARRINGTON	S.S. JONES
97	4000*	CLUB 1/WA7833 SWW VARIETY RELEASE	PULLMAN	S.S. JONES
97	5000*	CLUB 1/WA7833 SWW VARIETY RELEASE	RITZVILLE	S.S. JONES
97	6000*	CLUB 1/WA7833 SWW VARIETY RELEASE	WATERVILLE	S.S. JONES
97	6168**	WA7833 SWW VARIETY RELEASE	POMEROY	S.S. JONES
98	104	CLUB 1	ST. ANDREWS	S.S. JONES
98	106	CLUB 1	WATERVILLE	S.S. JONES
98	107	CLUB 1	PULLMAN	S.S. JONES
98	110	CLUB 1	RITZVILLE	S.S. JONES
98	111	CLUB 1	CONNELL	S.S. JONES

* Replicated data from Club 1 and WA7833 SWW Variety Release nurseries submited in 1997 were averaged by location and designated with a unique nursery number in the analysis to provide all locations with a unique nursery number.

** Nursery 168 is designated with a precursor digit in the analysis to provide all locations with a unique nursery number.

PVP#200100258
'BRUEHL'
EXPERIMENT#**WA7833**

TABLE 2. CHECK VARIETIES AND NURSERIES FOR WA7833 DATA SET

		1996						1997													
GENOTYPE	n	24	25	26	27	28	29	120	122	123	125	126	128	1168	2168	3168	4168	5168	6168	7168	8168	9168
WA7833	26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ELTAN	21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
HILLER	5													*	*	*	*	*	*	*	*	*
MADSEN	9																					

	1998				
GENOTYPE	104	106	107	110	111
WA7833	*	*	*	*	*
ELTAN					
HILLER	*	*	*	*	*
MADSEN					

5

PVP#200100258
'BRUEHL'
EXPERIMENT#**WA7833**

WA7833 ANALYSIS OF VARIANCE:

MEANS, LSD, PROBABILITY AND NUMBER OF PAIRED COMPARISONS BY GENOTYPE

TABLE 3a. GRAIN QUALITY

GENOTYPE	TEST WEIGHT #/bu	GRAIN PROTEIN %	GRAIN HARDNESS	THOUSAND KERNEL WEIGHT g	TKW STANDARD DEVIATION
WA7833	60.5	10.2	26	39.6	9.5
ELTAN	61.3*	10.6	22*	39.1	9.4
LSD	0.8	0.6	3	1.7	0.4
P-VALUE	0.04	0.28	0.04	0.53	0.58
N	15	15	15	15	15
WA7833	60.6	9.6	32	39.0	8.9
HILLER	59.0	8.7	28	35.5	8.9
LSD	2.6	2.0	8	3.5	0.7
P-VALUE	0.17	0.25	0.25	0.05	0.82
N	5	5	5	5	5
WA7833	61.5	9.4	27*	41.9	10.4
MADSEN	62.3*	10.4*	32	42.3	9.9
LSD	0.7	0.6	2	2.4	1.0
P-VALUE	0.02	<.01	<.01	0.71	0.33
N	9	9	9	9	9

* Significantly different at $\alpha = 0.05$.

TABLE 3b. MILLING AND FLOUR QUALITY

GENOTYPE	FLOUR YIELD %	BREAK FLOUR YIELD %	FLOUR ASH %	MILLING SCORE	FLOUR PROTEIN %	FLOUR SWELLING VOLUME cc/g	FLOUR RVA cP/12
WA7833	68.1*	44.1	0.37	84.1	8.7	27.0	107
ELTAN	65.4	44.0	0.34*	83.0	9.0	26.4	148
LSD	1.3	1.2	0.01	2.0	0.5	0.4	17
P-VALUE	<.01	0.51	<.01	0.24	0.16	<.01	<.01
N	15	9	15	15	15	9	9
WA7833	70.1	52.7	0.40	85.1	8.2	-	-
HILLER	70.4	53.9	0.42	84.0	7.3	-	-
LSD	2.0	2.3	0.04	5.1	1.7	-	-
P-VALUE	0.76	0.25	0.22	0.59	0.21	-	-
N	5	5	5	5	5	-	-
WA7833	68.2	46.4	0.36	84.7	7.8*	27.0	107
MADSEN	67.2	44.6	0.34*	85.2	8.7	26.1	133
LSD	2.1	5.4	0.02	2.7	0.5	1.1	13
P-VALUE	0.34	0.97	0.03	0.71	<.01	0.10	<.01
N	9	9	9	9	9	9	9

TABLE 3c. END-USE QUALITY

GENOTYPE	MIXOGRAPH WATER ABSORPTION %	COOKIE DIAMETER cc	TOP GRAIN SCORE	SPONGE CAKE VOLUME cc	SPONGE CAKE SCORE
WA7833	51.8*	9.4*	6.4	1265	74
ELTAN	55.5	9.3	6.2	1270	73
LSD	0.9	0.1	0.9	44	3
P-VALUE	<.01	<.01	0.68	0.77	0.85
N	15	15	15	11	11
WA7833	52.8	9.6	7.2	1280	73
HILLER	51.1	9.5	7.0	1298	76
LSD	1.9	0.3	3.3	61	9
P-VALUE	0.07	0.54	0.87	0.33	0.39
N	5	5	5	3	3
WA7833	51.5*	9.5*	7.5	1283*	75*
MADSEN	54.0	9.2	6.7	1233	71
LSD	1.3	0.2	1.4	44	3
P-VALUE	<.01	<.01	0.21	0.03	0.02
N	9	9	9	9	9

PVP#200100258
'BRUEHL'
EXPERIMENT#**WA7833**

Table 4. Data Set for WA7833

OBS	YEAR	NURSCO	LABNUM	VAR	TWT	SKHRD	SKWT	SKWTSD	WPROT	FYELD	BKFYELD	MSCOR	FASH	FPROT	FSV	RVA	MABS	CAVOL	SCSCOR	CODI	TGS
1	96	24	240005	ELTAN	61.10	21.00	33.40	8.10	12.50	65.50	41.50	83.50	0.330	11.10	.	.	57.50	1230	71	9.110	2.0
2	96	24	240021	WA7833	60.40	28.00	37.40	8.20	12.20	70.00	41.50	84.80	0.400	10.80	.	.	51.90	1200	66	9.200	3.0
3	96	25	250005	ELTAN	56.70	19.60	27.00	8.10	14.70	61.20	42.30	79.90	0.300	12.60	.	.	60.30	.	.	8.770	1.0
4	96	25	250021	WA7833	57.50	23.90	29.80	7.70	11.50	66.90	43.80	84.60	0.340	10.40	.	.	53.30	.	.	9.290	5.0
5	96	26	260005	ELTAN	56.20	18.20	25.10	7.40	15.60	61.80	41.10	74.30	0.400	13.80	.	.	61.40	.	.	8.610	1.0
6	96	26	260021	WA7833	55.10	25.30	27.80	8.20	15.60	62.50	39.30	69.50	0.490	13.50	.	.	56.40	.	.	8.980	2.0
7	96	27	270005	ELTAN	61.90	21.00	35.50	7.40	9.30	68.40	46.40	88.50	0.310	8.10	.	.	54.40	1340	79	9.440	7.0
8	96	27	270021	WA7833	58.50	7.60	37.50	6.60	7.60	69.70	48.70	88.20	0.340	6.20	.	.	50.10	1160	68	9.490	6.0
9	96	28	280005	ELTAN	61.60	29.60	35.10	8.70	11.90	68.40	44.80	89.10	0.300	10.10	.	.	54.40	.	.	9.290	6.0
10	96	28	280021	WA7833	60.30	25.20	40.00	8.30	10.40	69.20	42.80	88.90	0.320	8.90	.	.	49.60	.	.	9.520	7.0
11	96	29	290005	ELTAN	60.00	20.20	47.00	9.20	10.30	61.40	40.20	73.80	0.400	9.10	.	.	57.40	.	.	9.380	8.0
12	96	29	290021	WA7833	62.20	29.90	44.00	9.80	11.50	69.20	41.90	83.10	0.410	10.10	.	.	52.50	.	.	9.440	5.0
13	97	1000	.	ELTAN	61.10	17.85	39.60	9.10	8.10	66.25	48.00	82.90	0.355	6.80	26.7	144	53.10	1285	75	9.540	7.5
14	97	1000	.	MADSEN	62.40	34.40	40.50	10.20	9.80	66.90	44.50	84.00	0.350	8.40	26.7	126	53.60	1230	70	9.400	8.0
15	97	1000	.	WA7833	61.10	25.70	40.00	10.35	8.40	69.15	46.45	86.25	0.360	7.10	26.7	73	50.75	1290	77	9.495	7.5
16	97	1168	1680002	ELTAN	62.90	23.00	41.30	10.80	10.40	67.70	46.90	85.00	0.350	8.80	26.4	151	55.00	1200	67	9.610	9.0
17	97	1168	1680003	MADSEN	62.40	26.70	41.90	9.50	11.40	70.80	45.80	89.00	0.350	9.50	27.0	164	53.20	1265	73	9.480	8.0
18	97	1168	1680001	WA7833	61.30	26.40	37.80	10.80	10.40	70.30	48.20	85.20	0.400	8.60	27.0	136	53.70	1230	72	9.390	8.0
19	97	2000	.	ELTAN	62.05	16.60	44.15	9.65	8.20	67.15	46.90	84.95	0.340	6.85	28.0	139	53.65	1295	75	9.410	8.0
20	97	2000	.	MADSEN	62.70	26.10	46.40	9.40	10.50	66.50	43.20	85.40	0.320	8.90	24.3	131	54.10	1225	68	9.120	5.0
21	97	2000	.	WA7833	61.80	21.90	46.10	11.30	8.90	69.35	21.95	85.85	0.370	7.50	28.0	113	51.55	1290	75	9.595	8.0
22	97	3000	.	ELTAN	63.80	26.75	48.65	9.90	10.55	65.15	43.55	83.05	0.330	8.75	25.0	160	54.65	1245	70	9.220	6.5
23	97	3000	.	MADSEN	62.00	36.40	42.30	11.90	12.00	65.30	41.50	79.40	0.390	10.20	25.3	110	54.70	1080	59	9.010	7.0
24	97	3000	.	WA7833	62.85	28.75	49.00	9.85	10.55	68.25	43.55	84.75	0.365	8.80	26.4	93	51.20	1245	71	9.400	7.5
25	97	3168	1680008	ELTAN	62.80	26.30	42.80	11.40	8.90	67.10	45.90	83.60	0.360	7.60	26.7	133	53.10	1275	73	9.430	8.0
26	97	3168	1680009	MADSEN	63.60	31.00	48.40	11.20	10.00	69.40	41.80	87.80	0.340	8.40	27.0	146	52.20	1260	74	9.290	7.0
27	97	3168	1680007	WA7833	61.80	28.10	46.30	10.70	8.90	69.50	45.40	85.40	0.380	7.60	26.7	109	51.10	1265	75	9.410	8.0
28	97	4000	.	ELTAN	63.15	29.85	38.85	10.85	9.50	66.75	45.25	86.05	0.315	8.15	27.0	143	53.75	1295	74	9.395	7.5
29	97	4000	.	MADSEN	62.40	38.00	36.50	9.50	9.90	66.90	44.10	85.30	0.330	8.40	26.4	117	54.10	1270	72	9.210	8.0
30	97	4000	.	WA7833	60.40	35.80	33.15	9.35	8.85	63.85	51.60	80.40	0.345	7.55	27.7	112	50.75	1360	78	9.515	7.0
31	97	5000	.	ELTAN	63.45	22.10	44.40	10.05	9.25	66.70	44.80	85.70	0.320	7.75	25.7	158	55.10	1255	72	9.480	7.5
32	97	5000	.	MADSEN	61.30	29.70	41.70	9.70	10.30	62.90	41.40	82.10	0.300	8.20	25.7	124	56.10	1270	73	8.940	2.0
33	97	5000	.	WA7833	61.45	23.25	42.95	9.95	8.70	68.85	46.00	85.25	0.370	6.90	27.0	86	51.25	1320	78	9.620	6.5
34	97	6000	.	ELTAN	61.65	21.45	42.00	10.65	10.90	61.80	42.85	79.10	0.325	9.20	25.0	156	55.45	1275	74	9.260	6.0
35	97	6000	.	MADSEN	62.80	36.30	41.50	9.50	12.00	66.70	43.60	83.80	0.350	10.00	24.3	124	56.20	1220	71	9.260	8.0
36	97	6000	.	WA7833	62.35	30.05	41.80	11.55	11.55	65.65	42.45	82.40	0.350	9.60	26.0	126	52.45	1260	74	9.405	7.0
37	97	6168	1680017	ELTAN	61.90	18.50	41.50	8.90	8.20	66.20	46.90	85.00	0.320	6.80	26.7	149	53.40	1280	76	9.350	8.0
38	97	6168	1680018	MADSEN	61.90	30.00	41.90	8.30	7.60	69.80	46.20	89.60	0.320	6.10	28.4	152	51.60	1280	76	9.450	7.0
39	97	6168	1680016	WA7833	60.60	23.40	40.30	9.40	8.50	68.70	45.60	86.90	0.340	6.90	27.4	119	50.60	1290	75	9.660	8.0
40	98	104	1040001	HILLER	59.70	23.90	37.50	8.80	7.90	70.10	53.60	84.30	0.410	6.70	.	.	50.00	1310	78	9.530	5.0
41	98	104	1040004	WA7833	61.30	30.80	39.80	9.00	8.90	69.60	52.50	84.90	0.390	7.40	.	.	53.00	1275	73	9.740	8.0
42	98	106	1060001	HILLER	54.90	26.40	27.30	9.60	10.00	65.70	50.70	69.70	0.550	8.50	.	.	51.70	1335	77	9.350	5.0
43	98	106	1060004	WA7833	58.70	31.20	34.70	9.40	10.20	68.20	50.90	78.00	0.470	8.70	.	.	52.10	1305	73	9.610	8.0
44	98	107	1070001	HILLER	62.20	39.20	37.40	9.10	9.30	71.60	53.90	90.00	0.350	7.90	.	.	52.00	1250	72	9.710	9.0
45	98	107	1070004	WA7833	60.40	32.90	37.70	8.50	9.00	71.20	54.00	89.50	0.350	7.70	.	.	51.70	1260	74	9.860	8.0
46	98	110	1100001	HILLER	59.80	23.90	38.40	8.00	7.80	73.20	57.00	91.40	0.360	6.40	.	.	51.50	.	.	9.250	8.0
47	98	110	1100004	WA7833	62.60	33.70	43.80	8.80	11.50	71.30	52.60	89.60	0.350	9.70	.	.	54.70	.	.	9.290	5.0
48	98	111	1110001	HILLER	58.50	26.40	36.80	9.10	8.30	71.50	54.10	84.80	0.430	7.10	.	.	50.40	.	.	9.640	8.0
49	98	111	1110004	WA7833	59.90	29.30	39.00	8.60	8.50	70.60	53.60	83.60	0.430	7.70	.	.	52.40	.	.	9.320	7.0

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Washington State University Research Foundation	WA007833	Bruehl
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	**5. TELEPHONE** *(Include area code)*	**6. FAX** *(Include area code)*
1610 NE Eastgate Blvd., Pullman, WA 99163 USA	(509) 335-5526	(509) 335-7237
	7. PVPO NUMBER	

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. **If no, please explain** [X] YES [ ]

9. Is the applicant (individual or company) a U.S. National or a U.S. based company? **If no, give name of country** [X] YES [ ] NO

10. Is the applicant the original owner? [ ] YES [X] NO **If no, please answer one of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

[X] YES [ ] NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

[ ] YES [ ] NO If no, give name of country

11. Additional explanation on ownership *(If needed, use the reverse for extra space)*:

Bruehl was selected by Dr. Stephen S. Jones, WSU winter wheat breeder and geneticist. His predecessor, Dr. C.J. Peterson, Jr. (WSU retiree) made the original cross in 1989. Washington State University's ownership interests were assigned to the Washington State University Research Foundation.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

- *EXHIBIT E. Statement of the Basis of the Applicant's Ownership:*
  The statement in the Crop Registration document "...developed in cooperation with the Agricultural Experiment Station of the University of Idaho and the United States Department of Agriculture-Agricultural Research Service (USDA-ARS)" should not be construed as a statement of ownership or intellectual property. That language is standard with regard to joint releases under our Tri-State General Agreement (WA, ID, OR, USDA). The Tri-State General Agreement provides for a coordinated release of jointly developed new varieties, collaboration with regard to our agricultural research mission (i.e. testing), and promotion of these varieties for increased public utilization and general welfare.

  Bruehl was selected by Dr. Stephen S. Jones. His predecessor, Dr. C.J. Peterson, Jr. (WSU retiree) made the original cross in 1989. In the final testing of the variety, collaborators from USDA and UI Extension (as well as WSU Extension) were involved with independent performance testing only; as such USDA and UI do NOT have any claim of ownership.